

while in a third Dr. Bashford Dean adduces evidence to prove the existence of vestiges of an original holoblastic cleavage in the egg of the Japanese representative of the Port Jackson shark. This discovery is of the highest morphological importance, sharks' eggs having been hitherto regarded as typically meroblastic. "No one, I fancy," writes the author, "would have been bold enough to have prophesied that the wide difference between the typically meroblastic egg of the shark and the holoblastic egg of such a teleostome as a sturgeon might come to be bridged over within the limits, not of fossil sharks, but of recent sharks themselves."

THE singular bulbiform seeds of certain Amaryllidæ—especially species of *Amaryllis* and *Crinum*—are the subject of an interesting paper by Dr. A. B. Rendle in the November number of the *Journal of Botany*. These seeds are of three kinds:—(1) True seeds developed from a normal ovule, the outer integument of which becomes thick and fleshy after fertilisation, and forms the substance of the bulbiform mass; (2) true seeds developed from a naked ovule, the fleshy substance being derived entirely from the endosperm, which develops chlorophyll in its outer layers and continues to grow for some time; (3) a vegetative growth replacing the seed; a normal ovule is produced, but a viviparous growth of an adventitious shoot and root takes place at the base, and a bulbil is formed, the ovule integuments forming the outer coats.

DR. FRIEDRICH BERWERTH has communicated to the Vienna Academy of Sciences a paper on soundings from the eastern Mediterranean. In regard to the distribution of calcareous mud, it is found that two principal zones exist, one to the north of the Nile delta, which extends along the Syrian coast and contains but little carbonate of lime (5 to 15 per cent.), while the other, consisting of the remainder of the eastern Mediterranean, is largely calcareous, the proportion of chalky matter being on an average 60 per cent., with variations of 20 per cent. above and below this average. The relation between the proportion of calcareous matter and the depth appears to be at variance with what would be expected from Murray's theory. The sedimentary matter consists, in general, of (1) calcareous organic remains (mollusca and foraminifera), (2) fragments of siliceous matter of organic origin, including sponges and radiolaria, (3) fragments of minerals and rocks, (4) a precipitate, partly calcareous, partly argillaceous, showing little microscopic structure, which constitutes the main part of the mud.

A SOUND and practical knowledge of "The Cyanide Process of Gold Extraction" can be obtained from the volume on that subject by Prof. James Park, published by Messrs. Charles Griffin and Co. The first English edition was favourably noticed in these columns last year (vol. lxii. p. 148), and the second has now appeared. The whole volume has undergone revision, and the new matter includes a detailed description of well-designed slime and sulphide plants now in use in the great mining centres of the world.—Another of Messrs. Griffin's technical handbooks which has reached a second edition is "Practical Coal Mining," by Mr. George L. Kerr, the first edition of which was reviewed in NATURE of February 28 (vol. lxiii. p. 417).

LOW-TEMPERATURE research at the Royal Institution during the past seven years has been assisted by the Hodgkins Trust Fund—a sum of 100,000 dollars left by the late Mr. T. G. Hodgkins as a source of income to be employed in the "investigation of the relations and co-relations existing between man and his Creator." To show what has been done towards this end, Miss Agnes M. Clerke has prepared for the Hodgkins Fund a popular essay on Prof. Dewar's work at the Institution from 1893 to 1900. The essay traces the course of his researches in the physics and chemistry of low temperature, and contains, in

addition, three illustrations showing the lecture table of the Royal Institution upon the occasion of the centenary commemoration lecture on liquid hydrogen, and the elaborate refrigerating-machinery and liquid hydrogen apparatus used by Prof. Dewar.

THE current number of the *Berichte* contains a paper, by A. Hantzsch and A. Holl, on sulphimide. This substance was first obtained by W. Traube from the products of the action of ammonia upon sulphuryl chloride, and the formula  $\text{SO}_2\text{NH}$  was attributed to it, from the analyses of its salts. In the present paper the authors have been successful in obtaining sulphimide in the solid form, and have found by molecular weight determinations that it resembles cyanuric acid in being trimolecular ( $\text{SO}_2\text{NH}$ )<sub>3</sub>. They have also succeeded in isolating the methyl ester of this substance, and have found that this is also trimolecular. It is pointed out that the analogy between the nitrogen derivatives of carbonic acid and sulphuric acid is much closer than has hitherto been supposed.

*Bulletin* No. 186 of the U.S. Geological Survey contains an interesting study of pyrites and marcasite, by Dr. H. N. Stokes, and describes a method for the quantitative determination of these minerals when in mixture. The method depends upon the fact that when either mineral is boiled with an excess of a solution of ferric salt to complete reduction of the latter the ratio of sulphur oxidised to mineral decomposed is perfectly definite and characteristic of each mineral, provided certain standard and easily controllable conditions are observed. Under these conditions the percentage of sulphur oxidised on pyrites is about 60.4 per cent. and on marcasite about 18 per cent. of the total sulphur. The application of this method has thrown considerable light on several doubtful questions relating to the dimorphous  $\text{FeS}_2$ . It is shown, for example, that density is not a trustworthy means of determining one mineral in presence of the other, that the hypothesis that most natural specimens are mixtures of the two is without foundation, and that there is no evidence of a difference of valency of iron in the two minerals. Specimens crystallising in the regular system are true pyrites, whilst those forming rhombic crystals are true marcasite.

THE additions to the Zoological Society's Gardens during the past week include a White-crowned Mangabey (*Cercopithecus aethiops*) from West Africa, presented by Mr. Fred Gordon; a Cape Zorilla (*Ichonyx zorilla*), a Derbian Zonure (*Zonurus giganteus*) from South Africa, presented by Mr. W. L. Sclater; a Gazelle (*Gazella dorcas*) from Egypt, presented by Mrs. Bensusan; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. John Booth; a Bauer's Parakeet (*Platycercus zonarius*) from South Australia, presented by Miss Gillam; a Lobed Chameleon (*Chamaeleon parvilobus*) from South Africa, presented by the Rev. Duncan Travers; a Chacma Baboon (*Cynocephalus porcarius*) from South Africa, an Alligator Terrapin (*Chelydra serpentina*), a Pennsylvanian Mud Terrapin (*Cinosternum pennsylvanicum*), a Muhlenberg's Terrapin (*Clemmys muhlenbergi*), six Long-eared Sun Fish (*Leptomis auritus*) from North America, deposited; three Australian Wild Ducks (*Anas superciliosa*), bred in the Gardens.

#### OUR ASTRONOMICAL COLUMN.

THE LEONID METEORS.—Arrangements are being made at several observatories to record, by eye observations and photography, any Leonid meteors which appear during the epoch of the Leonid meteoric shower, November 14–15.

NEBULOSITY SURROUNDING NOVA PERSEI.—A telegram from the Centralstelle at Kiel announces that from the examination of photographs taken with the Crossley reflector of the Lick

Observatory, Prof. Perrine has found four principal condensations of the faint nebula surrounding Nova Persei, and that these have been displaced *one minute of arc* to the south-east in a period of six weeks.

MEAN PARALLAX OF STARS.—No. 8 of the *Publications* of the Astronomical Laboratory at Groningen contains an investigation, by Prof. J. C. Kapteyn, of the mean parallax of stars considered with reference to their determined proper motions, magnitude and spectral type.

PLANETARY INFLUENCE ON SUN-SPOT PERIOD.—In the *Paris Comptes rendus* (vol. cxxxiii. pp. 726-729), Prof. Birke-land gives the discussion of a further attempt to trace any possible connection between the 11-yearly sun-spot period and the gravitational disturbance of the planets Mercury, Venus and Jupiter, using observations made from 1892-1896. He comes to the same conclusion as formerly, that the variations cannot be traced to planetary influence.

DISTRIBUTION OF COSMIC VELOCITIES.—Profs. J. C. Kapteyn and W. Kapteyn have recently completed the elaborate treatment of two preliminary communications made by the former to the Academy of Sciences at Amsterdam, and the first part of the treatise is published as No. 5 of the *Publications of the Astronomical Laboratory of Groningen*.

In this an attempt is made to deduce, from the available observations of proper motion, the law defining the relation between the number of stars having linear velocities of determined values, or shorter, the law by which the frequency of a linear velocity is given as a function of its magnitude. The main assumption on which the derivation is based is "the real motions of the stars are equally frequent in all directions."

In the papers mentioned above it had been stated that certain inequalities existed in the distribution of velocities with respect to the apex of the solar motion, and that these had been traced to the influence of a systematic error of the proper motions in declination. It is now thought that many of the former difficulties will be removed by the introduction of a correction for this anomaly.

The formulæ given are developed to such terms as are likely to provide for any great future extension of the accuracy attainable in proper motion determinations, and although the time may come when spectroscopic investigations of velocity (the accuracy of which does not depend on the distances) will supersede the present observations, at present the possibility of having two independent determinations from different components of the real motion is a valuable and important consideration.

The second part of the work, dealing with the application of these formulæ to the observations, will be presented in a later publication.

### THE INFLUENCE OF THE MEDITERRANEAN PEOPLES IN PREHISTORIC BRITAIN.<sup>1</sup>

THE progress of archaeological discovery during the last twenty years has thrown a flood of light on the relation of the prehistoric period in Europe north of the Alps to the civilisation of the Mediterranean in the period embraced by history. We are now in a position to recognise the source from which the inhabitants of middle and northern Europe, and of the British Isles, obtained the art manifested in their articles of daily use, and we are able to trace them back to that wonderful Mediterranean civilisation, proved by the labours of Schliemann to be older than the Greeks and shown recently by Mr. Arthur Evans to have occupied a commanding position in the island of Crete. Schliemann discovered its range over the eastern Mediterranean from Troy to the Peloponnese, Evans extends it to almost within sight of Italy, where the Etruscan civilisation is the dominant factor at the dawn of history.

The picture presented to us of the Mediterranean region during the period extending from the establishment of the Greeks in the east and the Romans in the west, backwards to at least 2300 years B.C., as proved by the discoveries at Knossos, may be outlined as follows. A civilisation of the very highest order existed in the region extending from Italy eastwards through the Ægean Sea to Asia Minor, equal in splendour to that of Egypt and Assyria. Although it borrowed many things from both, it was a development independent of both, and, so far as the

evidence goes, it appears to have been indigenous in the Mediterranean region and Asia Minor. Whether or no it is as ancient as that of Egypt and Assyria is an open question.<sup>1</sup> It was common to the ancient Trojans and Mycenæans overthrown by the Greeks, to the Cretans, and to the Etruscans overthrown by the Romans. It is worthy of remark that in the eastern Mediterranean it formed the foundation of Greek art, while it survived in the west under the name of Roman, its possessors in each case being absorbed into the Greek and Roman peoples.

The establishment of the Phœnicians in the Eastern Mediterranean, at least as far back as the seventeenth century B.C., as proved in the records of Egypt, has also to be considered. They were the great merchants and carriers, distributing the wares of Egypt, and later of Assyria, to the various Mediterranean peoples, founding colonies here and there, among the greatest of which was Gades (Cadiz), about 1100 B.C., and Carthage, 814 B.C. Their fleets in penetrating westward had to contend with the Etruscan maritime power, dominant in the western Mediterranean. They and the Etruscans were the great distributors of metal, more particularly bronze, and their ships penetrated in later times far northwards along the Atlantic shore. It is not at all improbable that Phœnician ships coasted along the Atlantic as far north as the British Isles, bringing with them the wares of the Mediterranean and returning with tin from Cornwall and gold from Ireland. There is, however, no absolute proof of their presence in Britain, because, like the English of to-day, they had no art of their own and merely imitated the art of other peoples.

During the period under consideration, the various peoples inhabiting the Mediterranean were sufficiently organised to allow of a confederacy for the attack of Egypt. The first mention of a European people in the Egyptian annals is the attack of the Sardones and the Tyrrhenes (Etruscans) and their defeat by Ramses II. in the seventeenth century B.C. This was followed about seventy years afterwards by a more formidable combination, in which the two above-mentioned peoples were joined by the Sicels, Lycians, Achæans and Lybians. The allies advanced by sea and land, conquered part of the Delta, and were defeated after a desperate struggle by Menephtah I.

It remains now to trace the influence of the Mediterranean civilisation through middle and northern Europe. The two oldest routes of traffic are those starting from the head of the Adriatic, from the ancient Etruscan city of Hatria. The first runs by Trieste, Laibach, Gratz and Bruck, to Presburg, and thence past Breslau and along the Lower Vistula to the amber coast of Samland. The second, or western route, takes the line of the Adige, past Verona and Trient, over the Brenner Pass into the valley of the Inn, crossing the Danube either at Linz or Passau. Thence it ran through the Bohemian passes into the valley of the Elbe, and made for the amber coast of Schleswig and Holstein. These were the two principal routes taken by the caravans, which brought to the inhabitants of middle and northern Europe in the Bronze Age bronze swords, axes, daggers, bracelets, brooches and other articles from the south, carrying back, among other things, the amber so highly valued by the Mediterranean peoples. There were probably similar routes to these northwards and westwards over the plains of France, starting from the Alpine passes, and along the river valleys, along the lines afterwards followed by the Greeks of Marseilles (Massilia). It was probably by one or other of these routes that brooches, swords and other implements of southern derivation, arrived at the sea-board of the North Sea and Atlantic, and were brought by ship into Britain and Ireland. Ireland, it must be noted, at this time was the *El Dorado* of the west, attracting adventurers from the south both by sea and land.

These routes were also used in the prehistoric Iron Age north of the Alps, and along them metal work of most beautiful design, brooches and bracelets, mirrors and other articles, belonging to the so-called "late Celtic" art, were introduced into Britain—such, for example, as the mirror, brooch, and bronze bowl found at Glastonbury. In Ireland this art is amply represented in the numerous golden and bronze ornaments.

The Greeks, too, after their establishment at Massilia in the sixth century B.C., took up this trade, making clearly defined routes through France, to the Atlantic shore and to the Rhine valley, along which the tin of Cornwall was carried overland to

<sup>1</sup> Presidential Address by Prof. Boyd Dawkins, D.Sc., F.R.S., to the Vesey Club, on October 15, illustrated with slides.

I feel unable to accept Prof. Flinders Petrie's conclusion, that some of the pottery found in the tombs of the first dynasty in Egypt belongs to the Mycenæan or Ægean pottery, and therefore goes back as far as 4750 B.C.